In the Claims

1. (Original) An optical node comprising:

a data interface operable to receive data for transmission to a destination node;

a buffer operable to store the data;

a transmitting unit operable to couple to an optical transmission medium having a plurality of data channels and to selectively transmit optical signals on the data channels; and

a controller operable to receive a first token authorizing transmission on one of the data channels, to generate a transmission control message identifying the destination node and the authorized data channel, to communicate the transmission control message to a next node, to communicate a second token to the next node authorizing secondary transmissions on the authorized data channel, to transmit the data on the authorized data channel using the transmitting unit after communicating the transmission control message, and to communicate the first token to the next node after communicating the second token to the next node.

2. (Original) The optical node of Claim 1, wherein the optical node is one of a plurality of optical nodes on an optical communication ring and the second token authorizes other optical nodes on the optical communication ring to transmit the secondary transmissions on the authorized data channel in a section of the authorized data channel and at a time so as not to conflict with transmission of the data by the optical node.

3. (Original) The optical node of Claim 1, wherein the controller is further operable to communicate the second token to the next node before beginning transmission of the data on the authorized data channel, and to communicate the first token to the next node after completing transmission of the data on the authorized data channel.

4. (Original) The optical node of Claim 1, wherein the controller is further operable to communicate the first token to the next node after a delay, wherein the delay prevents a collision of a first and second transmission on an optical communication ring.

5. (Original) The optical node of Claim 1, wherein the controller is further operable to communicate the first token to the next node after a delay, wherein the delay is equal to a transmission allocation associated with the authorized data channel.

6. (Original) The optical node of Claim 1, wherein the transmitting unit includes a tunable laser, and the controller is further operable to tune the laser to transmit first optical signals associated with the data on the authorized data channel.

7. (Original) The optical node of Claim 1, further comprising:

a receiving unit operable to couple to the optical transmission medium and to selectively receive second optical signals on the data channels; and

an incoming buffer operable to store incoming data;

wherein the data interface is further operable to transmit the incoming data to a local destination; and

wherein the controller is further operable to receive a second transmission control message identifying a second destination node and a second authorized data channel, to determine whether the optical node is the second destination node, and to receive the second optical signals on the second authorized data channel using the receiving unit after determining that the optical node is the second destination node.

8. (Original) The optical node of Claim 7, wherein the receiving unit includes a tunable filter, and the controller is further operable to tune the filter to receive the second optical signals on the second authorized data channel.

9. (Original) An optical communication system comprising:

a plurality of optical communication nodes;

optical transmission media interconnecting the optical communication nodes, the optical transmission media having a plurality of data channels; and

a plurality of first logical tokens corresponding to the data channels;

wherein each of the optical communication nodes is operable to:

receive data for transmission to a destination one of the optical communication nodes;

receive one of the first logical tokens;

identify one of the data channels associated with the logical token;

schedule a data transmission using the identified data channel;

communicate a transmission control message identifying the scheduled data transmission;

communicate a second logical token to a next optical communication node, the second logical token authorizing a secondary data transmission using the identified data channel; and

transmit the data to the destination optical communication node using the identified data channel after communicating the second logical token to the next optical communication node.

10. (Original) The optical communication system of Claim 9, wherein the optical communication system is an optical communication ring and the second token authorizes optical communication nodes other than an optical communication node that generates the second token to transmit the secondary data transmissions on the identified data channel in a section of the identified data channel and at a time so as not to conflict with transmission of the data by the optical communication node that generates the second token.

11. (Original) The optical communication system of Claim 9, wherein each of the optical communication nodes is further operable to communicate the second logical token to the next optical communication node before beginning transmission of the data on the identified data channel, and to communicate the first logical token to the next optical communication node after completing transmission of the data on the identified data channel.

12. (Original) The optical communication system of Claim 9, wherein each of the optical communication nodes is further operable to communicate the first logical token to the next optical communication node after a delay, wherein the delay prevents a collision of a first and second transmission on an optical communication ring.

13. (Original) The optical communication system of Claim 9, wherein each of the optical communication nodes is further operable to communicate the first logical token to the next optical communication node after a delay, wherein the delay is equal to a transmission allocation associated with the identified data channel.

14. (Original) The optical communication system of Claim 9, wherein each of the optical communication nodes includes a transmitting unit that includes a tunable laser, and each of the optical communication nodes is further operable to tune the laser to transmit first optical signals associated with the data on the identified data channel.

15. (Original) The optical communication system of Claim 9, wherein each of the optical communication nodes comprises:

a receiving unit operable to couple to the optical transmission media and to selectively receive second optical signals on the data channels;

an incoming buffer operable to store incoming data; and

a data interface operable to transmit the incoming data to a local destination;

wherein each of the optical communication nodes is further operable to receive a second transmission control message identifying a second destination node and a second identified data channel, to determine whether the optical communication node is the second destination node, and to receive the second optical signals on the second identified data channel using the receiving unit after determining that the optical communication node is the second destination node.

16. (Original) The optical communication system of Claim 15, wherein the receiving unit includes a tunable filter, and each of the optical communication nodes is further operable to tune the filter to receive the second optical signals on the second identified data channel.

17. (Original) A method for token-controlled data transmission comprising:

receiving data for transmission to a destination node;

storing the data in a buffer;

coupling to an optical transmission medium having a plurality of data channels;

receiving a first token authorizing transmission on one of the data channels;

generating a transmission control message identifying the destination node and the authorized data channel;

communicating the transmission control message to a next node;

communicating a second token to the next node authorizing secondary transmissions on the authorized data channel;

transmitting the data on the authorized data channel after communicating the transmission control message; and

communicating the first token to the next node after communicating the second token to the next node.

18. (Original) The method of Claim 17, wherein the second token authorizes optical nodes other than an optical node that generates the second token to transmit the secondary transmissions on the authorized data channel in a section of the authorized data channel and at a time so as not to conflict with transmission of the data by the optical node that generates the second token.

19. (Original) The method of Claim 17, wherein communicating the second token to the next node occurs before beginning transmission of the data on the authorized data channel, and communicating the first token to the next node occurs after completing transmission of the data on the authorized data channel.

20. (Original) The method of Claim 17, further comprising determining whether to delay communicating the first token and delaying communication of the first token to the next node in response to determining to delay communicating the first token, wherein the delay prevents a collision of a first and second transmission on an optical communication ring.

21. (Original) The method of Claim 17, further comprising determining whether to delay communicating the first token and delaying communication of the first token to the next node in response to determining to delay communicating the first token, wherein the delay is equal to a transmission allocation associated with the authorized data channel.

22. (Original) The method of Claim 17, wherein transmitting the data on the authorized data channel includes tuning a laser to transmit first optical signals associated with the data on the authorized data channel.

23. (Original) The method of Claim 17, further comprising:

receiving a second transmission control message identifying a second destination node and a second authorized data channel;

determining whether an optical node is the second destination node;

receiving the second data on the second authorized data channel after determining that the optical node is the second destination node;

storing the second data in a second buffer; and

transmitting the second data to a local destination.

24. (Original) The method of Claim 23, wherein receiving the second data on the second authorized data channel includes tuning a filter to receive second optical signals associated with the second data on the second authorized data channel.

25. (Original) Logic for token-controlled data transmission, the logic encoded in media and operable when executed to:

receive data for transmission to a destination node;

store the data in a buffer;

couple to an optical transmission medium having a plurality of data channels;

receive a first token authorizing transmission on one of the data channels;

generate a transmission control message identifying the destination node and the authorized data channel;

communicate the transmission control message to a next node;

communicate a second token to the next node authorizing secondary transmissions on the authorized data channel;

transmit the data on the authorized data channel after communicating the transmission control message; and

communicate the first token to the next node after communicating the second token to the next node.

26. (Original) The logic of Claim 25, wherein the second token authorizes optical nodes other than an optical node that generates the second token to transmit the secondary transmissions on the authorized data channel in a section of the authorized data channel and at a time so as not to conflict with transmission of the data by the optical node that generates the second token.

27. (Original) The logic of Claim 25, further operable when executed to communicate the second token to the next node before beginning transmission of the data on the authorized data channel, and communicate the first token to the next node after completing transmission of the data on the authorized data channel.

28. (Original) The logic of Claim 25, further operable when executed to determine whether to delay communicating the first token and delay communication of the first token to the next node in response to determining to delay communicating the first token, wherein the delay prevents a collision of a first and second transmission on an optical communication ring.

29. (Original) The logic of Claim 25, further operable when executed to determine whether to delay communicating the first token and delay communication of the first token to the next node in response to determining to delay communicating the first token, wherein the delay is equal to a transmission allocation associated with the authorized data channel.

30. (Original) The logic of Claim 25, further operable when executed to tune a laser to transmit first optical signals associated with the data on the authorized data channel.

31. (Original) The logic of Claim 25, further operable when executed to:

receive a second transmission control message identifying a second destination node and a second authorized data channel;

determine whether an optical node is the second destination node;

receive the second data on the second authorized data channel after determining that the optical node is the second destination node;

store the second data in a second buffer; and

transmit the second data to a local destination.

32. (Original) The logic of Claim 31, further operable when executed to tune a filter to receive second optical signals associated with the second data on the second authorized data channel.

33. (Original) An optical node comprising:

means for receiving data for transmission to a destination node;

means for storing the data in a buffer;

means for coupling to an optical transmission medium having a plurality of data channels;

means for receiving a first token authorizing transmission on one of the data channels;

means for generating a transmission control message identifying the destination node and the authorized data channel;

means for communicating the transmission control message to a next node;

means for communicating a second token to the next node authorizing secondary transmissions on the authorized data channel;

means for transmitting the data on the authorized data channel after communicating the transmission control message; and

means for communicating the first token to the next node after communicating the second token to the next node.

34. (Original) A method for token-controlled data transmission comprising:

receiving data for transmission to a destination node;

storing the data in a buffer;

coupling to an optical transmission medium having a plurality of data channels;

receiving a first token authorizing transmission on one of the data channels;

generating a transmission control message identifying the destination node and the authorized data channel;

communicating the transmission control message to a next node;

communicating a second token to the next node authorizing secondary transmissions in an unused portion of the authorized data channel;

transmitting the data on the authorized data channel after communicating the transmission control message, wherein transmitting the data on the authorized data channel includes tuning a laser to transmit first optical signals associated with the data on the authorized data channel; and

determining whether to delay communicating the first token; and

communicating the first token to the next node after communicating the second token to the next node and after a delay in response to determining to delay communicating the first token;

wherein communicating the second token to the next node occurs before beginning transmission of the data on the authorized data channel; and

wherein communicating the first token to the next node occurs after completing transmission of the data on the authorized data channel.